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59th Medical Wing, Lackland AFB TX

FINAL REPORT

MENTORS OFFERING MATERNAL SUPPORT (M.O.M.S.)

August 2, 2011

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CHAPTER I

BACKGROUND

Prenatal Maternal Adaptation

Maternal prenatal psychosocial development occurs throughout pregnancy and into the postpartum period. During pregnancy, a woman reformulates and alters her existing identity to develop a maternal identity and role (Flagler & Nicoll, 1990). The dramatic developmental changes a woman experiences in regard to her self-image may cause anxiety, fear, anger, and grief during pregnancy (Trad, 1991). A fear of never being the same again can be unsettling and cause stress and anxiety (Lederman & Weis, 2009). This prenatal maternal stress (conflict) has an adverse impact on birth outcomes, including birth weight and gestational age at birth (Hobel, Goldstein, & Barrett, 2008; Kramer et al., 2009; Latendresse, 2009). Prenatal maternal conflict is also related to maternal-infant responsiveness and cognitive-motivational competence of infants and school-aged children (Walker & Montgomery, 1994). Weis, Lederman, Lilly & Schaffer (2008) found gravidas having deployed military husbands had greater conflict with their prenatal maternal adaptation (pregnancy acceptance and identifying with their maternal role) than pregnant military wives without deployed husbands. Their conflict with maternal adaptation persisted long after the husbands' return despite the return of many of the men prior to delivery. The gravidas conflict with accepting pregnancy and identifying with their maternal role had a statistically significant negative effect on estimated gestational age at delivery and infant birth weight (Lederman & Weis, 2009). The gravidas with an on-base support network versus off base had significantly less conflict with acceptance of pregnancy (Weis, Lederman, Lilly & Schaffer, 2008). Support from a role model provides information and validation for the changes the gravida experiences prenatally and postnatally (Muller, 1990; Rubin, 1984). Although military families face the same life course issues faced by all society, the conflict and anxiety experienced during prenatal maternal adaptation may be greater for military wives because

of the isolating factors associated with military life, combined with increased responsibilities and stress associated with military-imposed separations.

Supportive Relationships in Pregnancy

Achieving maternal role identity requires “self-socialization” and testing of self-definitions (Deutsch et al., 1988; Rubin, 1967). Importantly, the self-socialization perspective suggests that rather than being an unconscious process, identity formation is a constructive process involving active information seeking (Deutsch et al., 1988). Self-definitional changes accompany significant life transitions and pregnancy, and a woman’s formulation of her maternal role identity is one of these life transitions. Her transformation is effected through communication and interaction (LaRossa & Reitzes, 1993).

Relationship with Husband/Partner

The marital relationship has been reported as the most significant dimension affecting the course of pregnancy (Wenner, Cohen, Weigert, Kvarnes, Ohaneson, & Fearing 1969). Importantly, marital and family dysfunction were found to be significant determinants of preterm birth (Dole et al., 2004) and lower infant birthweight (Abel, Baker, Clover, & Ramsey, 1991; Dole et al., 2004; Ramsey, Abell, & Baker, 1986). A poor relationship with one’s husband is also associated with maternal prenatal and postpartum depression (Centers for Disease Control and Prevention, 2008). In a military population, Lederman & Weis (2009) found that the gravida’s perceived flexibility of the family in the first trimester significantly decreased conflict associated with all seven of Lederman’s (1996, 2009) pregnancy specific dimensions of maternal adaptation. In early research, Lederman, Lederman, Work and McCann (1979), found a poor marital relationship was associated with earlier admission to the labor unit, administration of sedatives and tranquilizers in early labor to quell anxiety, and subsequent prolonged duration of labor. In later work, the gravida’s relationship with her husband was found to be a significant predictor of gestational age at first prenatal visit and of the length of gestation (Lederman, Weis, Camune, & Mian, 2002). Both maternal and paternal happiness about pregnancy also are associated with birth weight, and differentiated low- and high-risk birth weight groups (Keeley, et al., 2004).

It appears that active support and involvement during pregnancy are associated with lower levels of anxiety, and, for expectant fathers, represent the best means of coping with the stress of pregnancy (Teichman & Lahav, 1987). This is an important finding in terms of military couples facing frequent, lengthy deployments during the years when they are also planning families. There is little longitudinal data indicating the impact of the husband's absence due to military deployments on pregnancy outcomes and maternal and infant development. Additionally, couples who report high prenatal relationship quality (relationship satisfaction, communication, and interpersonal processes) are more likely to remain involved in co-parenting (versus paternal disengagement) postpartally (Florsheim & Smith, 2005).

Relationship with mother

In addition to the woman's husband or partner, the woman's mother is a key contributor to the formation of the woman's maternal identity (Lederman and Weis, 2009; Rubin, 1984). The availability of a role model is a major determinant in the development of a sensibility regarding maternal role competence (Lederman & Weis). The pregnant woman's mother serves as a primary confidante and a source of information and experience. But when the mother is unavailable secondary to emotional or geographical distancing, divorce or death, the woman may substitute the step-mother, mother-in-law, sister, aunt, or friend as a role model (Lederman & Weis).

Similar to the findings for marital relationship, the relationship the woman has with her mother has been found to impact maternal prenatal psychosocial conflict as well as physiological measures of labor progress (Lederman, Lederman, Work, & McCann, 1979). Not surprising given the role modeling that occurs during pregnancy, a gravida's relationship with her mother also predicts confidence and satisfaction with motherhood and with infant tasks postpartum. There are certain components of the maternal relationship that are important. The important components are: 1) The availability of the grandmother (the gravida's mother), 2) The grandmother's reaction to the pregnancy, especially the acceptance of the pregnancy and her acknowledgement of her daughter as a mother, 3) The grandmother's respect of her daughter's autonomy, and 5) A willingness to reminisce with her daughter about her own childbearing experiences (Lederman & Weis,

2009). Military service, geographical dislocations, deployments, could all impact the important components to the gravida's relationship with her mother.

The maternal identity and role attainment theorists support the view that maternal identity is built through a process of role rehearsal (Lederman and Weis, 2009; Rubin, 1984). Maternal adaptation to pregnancy and motherhood requires an available, supportive network that is capable of providing "esteem-enhancing" appraisals (Heller, Swindle, & Dusenbury, 1986). The intention of the proposed intervention (Mentor's Offering Maternal Support, M.O.M.S. program) is to offer esteem-enhancing support.

Understandably, social support is an umbrella term that covers a variety of diverse phenomena (Sarason, Pierce, and Sarason, 1990). However, an underlying assumption of all models and empirical investigations is that "supported people are physically and emotionally healthier than nonsupported people" (Shumaker & Brownell, 1984).

Emotional support is believed to be most strongly and consistently associated with good health and well-being (Heaney & Israel, 2002). Feldman (2000) found that greater social support and less obstetric risk predicted higher birth weight. Structural equation modeling was used to test a latent variable of both tangible and emotional forms of support. The relation between social support and birth weight held after controlling for length of gestation. All measurements were taken in the third trimester. Weis and Lederman (2006) found that emotional esteem-building support from a community network in the first and second trimester of pregnancy was a significant predictor of infant birth weight. The parameter estimates for community support to infant birth weight indicated that first trimester support had greater impact on infant birth weight than second trimester support. Buka, Brennam, Rich-Edwards, Raudenbush, and Earls (2003) found neighborhood-level factors of support were also significantly associated with infant birth weight, and the neighborhood-adjusted predictors reduced the White versus African-American difference in birth weight to 124 grams..

Support has been shown to improve maternal-infant attachment. Mercer and Ferketich (1994) found that women with optimal family functioning and greater perceived support reported improved infant attachment. Atkinson (2000) confirmed through a meta-analysis that the mean effect size relating to maternal social support,

marital satisfaction, and depression was significantly related to infant attachment. Prenatal and postpartum social support were both associated with maternal sensitivity at 3 months postpartum and women who indicated larger support networks were found to be more sensitive in interactions with their infants than women with smaller networks. Social support and self-esteem has been found to have a stress-buffering effect to postpartum depressive symptoms (Ritter, Hobfoll, Lavin, Cameron, & Hulsizer, 2000).

Recent research is focusing not only on the behaviors involved in relationships, but on their meaning to the participants in the interaction (Sarason et al., 1990). Although a person's own characteristics may be an important determinant of relationship events and the general character of the relationships into which he or she enters, the interaction within the relationship adds unique variance above that determined by the characteristics of either participant (Sarason et al., 1990). Bradbury and Fincham (1988) demonstrated that participants' stable characteristics (beliefs about relationships, self-views) and characteristics of the interaction (memory of an action; what was said) can be shown to affect the outcome. It is recognized that persons low in social support may actually need a respite from relationships that are conflicting, demanding, or otherwise problematic. Clearly, for a military population feeling increasingly isolated, there is a need for readily available supportive advocates attuned to military unique issues, ready to listen.

An additional aspect of supportive relations, reciprocity, has important implications for an isolated military population. Both Clark (1984) and Wentowski (1981) argue that the rules of exchange vary according to the nature of the relationship. Wentowski (1981) found that the characteristic that distinguished relationships was not age, but the nature of the relationship itself. Relationships that were superficial appeared to use strict rules of exchange and, if something was provided, the receiver tended to immediately reciprocate by returning exactly what was received or something of equivalent value. On the other hand, relationships that were more intimate and longitudinal tended to require less immediate exchange and less immediate equivalence of value. Clark (1984) distinguished two types of relationships: communal and exchange. Communal exchanges are those in which both parties feel obligated to be responsive to each other's needs in a general rather than a

specific way. A communal relationship is a level of relationship that is seen with families, romantic partners, and friends. Exchange relationships are considered more pragmatic. Business relationship or exchanges among acquaintances are examples of exchange relationships. It is important to recognize that the current support system promoted in the Air Force, “wingman program” may fall in the exchange relationship category rather than the communal exchange category. If the assigned wingman has a relationship (which may be business or a work friendship) with the active duty member but does not know the family members then an exchange relationship exists. This sets up a support system that the family may view as reciprocal in nature. Although the family member(s) may not feel that they have to immediately reciprocate there may be the perception that if support is requested they will have to reciprocate at a later date. Importantly, people that are unable to reciprocate feel indebted or guilty about receiving unreciprocated help (Shumaker & Jackson, 1979), and are less likely to ask for help when they need it (Greenberg & Shapiro, 1971).

Support Interventions

Prenatal support interventions have focused on varying outcomes from decreasing anxiety (Barnett & Parker, 1985; Scott, Klaus, & Klaus, 1999), improving birth outcomes (Dyson et al., 1998; Norbeck, DeJoseph, & Smith, 1996; Oakley, Rajan, & Grant, 1990; Zimmer-Gembeck & Helfand, 1996), promoting attachment (Armstrong, Fraser, Dadds, & Morris, 2000), to parental caregiving (Olds et al., 1997; Olds, Henderson, & Kitzman, 1994). Few studies have focused specifically on decreasing prenatal conflict and promoting postpartum role attainment. Koniak-Griffin and Verzemnieks (1991) implemented an intervention program with the aim of improving certain affective and behavioral dimensions of maternal role attainment. Those in the experimental group received informational support from nurses. Their sample comprised 20 high-risk primiparous adolescents. The theoretical framework for the project was based on maternal role theory. Importantly, the conceptual definition for maternal role attainment was “the process in which the mother achieves competence in the role and integrates mothering behaviors into her established role set.” The intervention program was composed of four structured classes taught by a nurse, designed to increase knowledge about fetal/infant behaviors. During each class, participants listened to fetal heart tones. Fetal

activity logs were maintained over seven consecutive 24-hour periods and personal thoughts were recorded in a maternal diary. While there was a significant increase in maternal-fetal attachment scores, there were no significant changes in the scores between the treatment and control for the scales measuring self-confidence or for a competency scale, “Nursing Child Assessment Feeding Scale (NCAFS). A primary task of designing an effective intervention is to determine which treatments are effective to different problems. Yeaton and Sechrest (1981) describe this as the “conceptual relevance of treatment.” (p. 157).

It is logical for an intervention project that is aimed at helping women achieve maternal role attainment to be based on the theoretical concepts inherent within the maternal role attainment literature. Paramount to the theory is the concept of maternal identity i.e., that mothering is learned over time by acquiring skills and refining ideas (Rubin, 1967). Women who are nurtured and have positive role models have greater self-confidence and are able to formulate their maternal identity (Lederman, 1996). Clearly, interventions aimed at helping women achieve maternal role attainment would include role models. Results from a study by Lederman et al. (1981) indicate a need to provide care that is interpreted by the woman as supportive, and to achieve this goal by facilitating the development and use of “lay” support groups (Curry, 1981). Curry also stressed the need to evaluate each woman’s perception of her support systems. This approach not only requires a design that incorporates a means of obtaining the appropriate information, it also requires a different approach to analysis. Rather than analyzing the data in a conventional statistical model with positive or negative values added to a dependent variable for subjects in respective groups, plotting of the response on a particular dependent variable as a function of the treatment dose for each individual also must be done (Lipsey, 1990).

Theory is used to determine the timing for the support intervention. During pregnancy, early in the second trimester, a gravid woman realizes that she cannot control the changes that are occurring (Colman & Colman, 1971), and she begins to formulate her parenting role and the expected interactions with her infant (Lederman, 1990). Thus, it follows that the intervention should begin when the woman is formulating her maternal role. Theorists (Lederman, 1996; Rubin 1984) describe maternal role attainment and identity formation as a

longitudinal process occurring throughout pregnancy. Therefore, interactions between the participant and the interventionist should occur throughout the course of pregnancy.

Further evidence in the literature indicates early and continued supportive intervention is necessary throughout pregnancy. In an intervention designed for adolescents, Fulton, Murphy, and Anderson (1991) sought to increase mother's knowledge about child growth and development with the intent of decreasing inappropriate interactions with their children, and increasing the mothers' self-esteem. The majority of the participants were in their first and second trimester of pregnancy when they entered the program. The intervention included interviews and needs assessments in addition to home visits. Informational resources were provided throughout pregnancy. The results indicated that the mothers participating in the program had greater knowledge related to their children's growth and their parental skills, which significantly correlated with a decrease in inappropriate interactions with their children. However, no measurable differences were in the mothers' self-esteem. The findings are not surprising given that the program focused primarily on providing informational support rather than on esteem-building support. This study emphasizes the importance of the right treatment (intervention), given in the appropriate dosage, at the correct time (Sidani & Braden, 1998).

The goal of this study was to provide an interventional program of esteem-building support. It is believed that self-esteem and maternal prenatal adaptation and maternal resiliency will be increased by encouraging dialogue within the group designed to heighten the gravidas' understanding that their feelings and ongoing changes are normal and not unlike those of the entire group and of other pregnant women. Their concerns can be validated and acknowledged by maternal mentors within the framework of prenatal maternal adaptation.

CHAPTER II

METHODS

Study Design

The proposed randomized controlled study is an intervention designed to promote prenatal maternal psychosocial adaptation to pregnancy. The purposes of the study were to 1). Explore the feasibility of developing, implementing, and sustaining the M.O.M.S. program by examining gravida attendance and attrition patterns as well as acceptability, and suitability of the mentoring support intervention to gravida's of deployed service members, 2) Evaluate the participant and interventionist's satisfaction with the "Becoming a Mother Manual" and its effectiveness at increasing group interaction, and 3) Evaluate the effectiveness of the M.O.M.S. program to reduce conflict associated with prenatal maternal adaptation to pregnancy and enhance maternal-fetal attachment and self-esteem.

The participants were randomized to an intervention of 8 structured support sessions and unlimited unstructured support from a trained mentor. The control group received the current prenatal plan of care with home visits or informational support provided through the New Parent Support Program (if enrolled). The randomized (R) experimental design (Table 1), offers the most powerful strategy for testing causal hypotheses while minimizing the effect of factors other than the independent variable on the dependent variable (Buckwalter, Maas, & Wakefield, 1998). Data for all participants was collected at Sessions 1, 5, and 8.

Table 1. Pretest-posttest, randomized, controlled, repeated measured design

Session	<u>Experimental Intervention Sessions</u>							
	1	2	3	4	5	6	7	8
Experimental Group R	O ₁	X	X	X	O ₂	X	X	O ₃
Control Group R	O ₄				O ₅			O ₆

Theoretical Framework

Life course theory combined with prenatal maternal adaptation concepts forms the theoretical foundation for this study. Across the span of life, individuals follow pathways interspersed with transitions and states that socially shape their life trajectories (Hagestad, 2003). Life course theory contains five principles that contribute to human development and aging. The principles include: 1) human development and aging as a lifelong process; 2) human agency in situations that vary in constraints and options; 3 historical time and place; 4) timing in lives, and 5) linked lives (Elder & Johnson, 2003). Additionally, three core concepts define the transitions and trajectories: *timing*, *sequencing*, and *duration*. *Timing* refers to the age at which the transition occurs; *sequencing* describes the timing of two or more transitions, and *duration* describes the length of time one spends in a given state (Hagestad, 2003). It is recognized that culture defines one's specific place in time (Gieryn, 2000). Elder & Johnson stress that military service is an aspect of one's life course that will certainly produce a varied pathway as it would impact timing, sequencing, and duration of different transitions. Additionally, military imposed family separations would be considered a constraint that impacts individual and family options.

Pregnancy is a major transition for both a woman and her family. Pregnancy is a major life course event regardless of whether it is a first child. It is an interrelated, physical, psychological, and social experience (Flagler & Nicoll, 1990) in which the woman and the family assess their ability to take on added roles (Lederman, 1990). Close relationship processes (family or community social groups) are recognized as playing an important role in the psychological well-being of pregnant women (Dunkel-Schetter, Gurung, Lobel, & Wadhwa, 2001). The quality of the relationship is integral to the woman's adaptational process (Lederman & Weis, 2009). The relationship with the mother and father of the baby are believed to be the most important elements to the woman's developmental process and to healthy birth outcomes (Lederman & Weis, 2009). The *timing* of the pregnancy and whether it is intended or unexpected are critical to the woman's adaptation; i.e., her anxiety and conflict related to the pregnancy (Bouchard, Goudreau, & Hebert, 2006). The level of conflict, anxiety and stress that develop as a result of her unsupported concerns impact the *duration* of the pregnancy.

The military culture, and family adaptation and cohesion, uniquely impact the maternal adaptational life course. For this reason it is important to develop effective military-specific interventions for this population.

Study Variables and Measurement

Data as collected from participants at Times 1-3 of the study through the use of standardized interview schedules.

Table 2. Overview of study variables

Variable	Conceptual Definition	Instruments	T 1	T 2	T 3
Prenatal maternal adaptation (measure of conflict with adaptation)	A progressive self assessment and developmental step of being a woman without a child to a woman with a child; recognizing the separateness and individuality of the coming child	Lederman Prenatal Self-Evaluation Questionnaire (PSEQ), 79 items (7 scales)	X	X	X
Maternal-fetal attachment	Maternal affective experiences of closeness, tenderness, positive feelings about the fetus, a desire to know it, and mental representations of the future baby	Maternal Antenatal Attachment Scale (MAAS) 19-item scale	X	X	X
Self-esteem	The degree to which one values oneself	Rosenberg Self-Esteem Scale (RSE), 10-item scale	X	X	X
Perceived community support	The degree to which the person perceives the family is integrated into the community, views the community as a source of support in providing emotional, esteem, and network support.	Social Support Index (SSI), 17 item scale	X	X	X
Program satisfaction	Feelings of the participants and program mentors regarding the program length, objectives and the <i>Birth of a Mother</i> manual.	Satisfaction questionnaire(s) created specifically for the program			X

Lederman Self-Evaluation Questionnaire (PSEQ).

The *Lederman Self-Evaluation Questionnaire* (Lederman, 1996) was developed to measure a woman's adaptation to pregnancy over the course of the three trimesters of pregnancy. The instrument contains 79

statements, which comprise 7 scales measuring differing aspects of a woman's prenatal maternal adaptation. All items have four Likert response categories. The respondent is able to reflect on how she feels regarding statements by circling, "*Very Much So*," "*Moderately So*," "*Somewhat So*," or "*Not at All*." The participants were administered the entire instrument, 7 scales which included the dimensions of Well-Being of Self and Baby (10 items), Acceptance of Pregnancy (14 items), Identification of the Motherhood Role (15 items), Preparation for Labor (10 items), Fear of Helplessness and Loss of Control (10 items), Relationship with Husband (10 items) and, Relationship with Mother (10 items). Each scale contains both negatively and positively worded items. Higher scores on a scale indicate greater anxiety related to the formulation of the motherhood role. The scores do not necessarily indicate a positive or negative adaptation to pregnancy, but rather the level of anxiety the woman is experiencing relative to the particular dimension of motherhood. Lederman, Lederman, Work and McCann (1985) utilized a multitrait-multimethod approach (Campbell & Fiske, 1959) to ascertain convergent and divergent construct validity for the theoretical model of anxiety and the questions within the PSEQ. Significant relationships were found for biochemical markers of stress and anxiety during labor with the three subscales dealing specifically with fears related to the birthing experience. Cronbach's alpha coefficients for the scales range from $\alpha = .75$ to $.92$ (Lederman). The instrument has also shown good reliability ($\alpha = .83$ to $.94$) in an intervention study with military wives (Schachman et al., 2004).

Maternal Antenatal Attachment Scale (MAAS).

The *Maternal Antenatal Attachment Scale* (Condon, 1993) is an 19-item self-report questionnaire with a five-point Likert response format. The internal consistency for the scale is $\alpha = .82$. Higher scores indicate higher maternal-fetal attachment. Factor analysis yielded two distinct dimensions, Quality of Attachment (10 items), and Frequency of Attachment (9 items). The "Quality" dimension assesses affective experiences such as closeness, tenderness, positive feelings about the fetus, a desire to know it, and mental representations of the future baby. The "Frequency" dimension assesses the intensity of preoccupation with the fetus (time devoted to thinking about, talking to, and dreaming of the unborn baby). The scale focuses on thoughts and feelings

regarding the baby, rather than the pregnancy or the maternal role, which differentiates it from the Maternal-Fetal Attachment Scale (Cranley, 1981).

Rosenberg Self-Esteem Scale

The *Rosenberg Self-Esteem Scale* (Rosenberg, 1965) is a 10-item Guttman scale developed with items answered on a 4-point scale from “*Strongly agree*” (1) to “*Strongly disagree*” (4). A sample item is: “I feel that I have a number of good qualities.” With this tool, lower scores indicate a higher self-esteem. The possible range is 0 to 30, with higher scores indicating higher self-acceptance. Score between 15-25 are considered normal. Scores below 15% suggest low self-esteem. The reliabilities range from .84 to .90. The construct validity of the tool was demonstrated by examining its conformity to theoretical predictions (Rosenberg, 1979). The test-retest reliability was found to be 0.85.

Social Support Index

The *Social Support Index* (SSI) (McCubbin, Patterson, & Glynn, 1982), is a 17-item instrument designed to measure the degree to which families are integrated into the community, view the community as a source of support, and feel that the community can provide emotional, esteem, and network support. The instrument uses a 5-point Likert scale ranging from “*Strongly Agree*” (5) to “*Strongly disagree*” (1). A higher score indicates more perceived, anticipated social support. The SSI had a .40 validity coefficient with the criterion measure of family well-being (1982). Construct validity was assessed in a study with over 1,000 families and the perceived support was positively correlated with a family’s sense of fit within the community ($r = .40$). The internal reliability of the SSI was reported as $\alpha = .82$ and test-retest reliability as $\alpha = .83$.

Demographic Data

General demographic information necessary to describe the sample population was obtained. In addition, the participant was asked to provide information related to her husband’s deployment, length of the deployment, the location of the deployment if known, and if there was available phone contact or contact by email. The assumption being that women not knowing of their husband’s deployment location may have

greater anxiety associated with the deployment. Additionally, some deployment locations carry greater danger potentiating increases in anxiety. Given that the husband is central to a gravida's prenatal adaptation, the amount of contact the women had with their husbands was of interest. A total score for contact for both email and phone was figured for each participant. A variable was then created indicating, high, moderate, and low levels of contact based on the percentages of contact across the sample.

Sample and Procedures

The target population for the study were all gravid women receiving obstetrical care at Eglin AFB who were experiencing or anticipated deployment of their husbands during the course of their pregnancies. Importantly, this population included wives of military members stationed at Hurlburt Field. Inclusion in the study was limited to gravidas with: 1) a single gestation, 2) not greater than 12 weeks gestation at the time of entry into the study (recruitment), 3) a spouse in one of the American Armed Services, and 4) a spouse anticipating a deployment of at least one month in length during the pregnancy. Individuals anticipating change of duty station during the study, dependent daughters of active or retired military members, or those unable to understand or speak English were excluded. It was assumed that deployments of less than one month require few adjustments or role alterations within the family unit, and therefore the gravida does not experience any greater conflict with maternal adaptation than gravidas not experiencing the deployment of a spouse. Cutrona and Russel (1990) contend that the most influential dimension with regard to needed social support is controllability. There is very little control over military deployment. Daughters of active duty or retired military were not included in the study secondary to unique psychosocial concerns inherent in this population and the need for a different type of support program. Validity of some of the instruments has only been established for English-speaking participants, hence, the need to limit the sample to participants able to understand English. If participants were unable to read English, yet comprehend English, the instruments were read to them by a member of the research team.

Intervention

Treatment/Experimental Group

Eight semi-structured classes lasting 1 1/2 hours each provided the opportunity for gravid women to process their pregnancy experiences, foster reflectiveness, promote self-understanding, facilitate coping, and enhance their capacity for social support for each other. Central to group counseling is the importance of interpersonal relationships. Therapeutic factors inherent in the group process for relatively homogeneous gravid participants include the sense of universality of experience and instilling hope. Four sessions focused on dimensions of psychosocial adaptation using a semi-structured format. Table 3 provides the focused areas of discussion for each group session. Additionally, at each session, military-related concerns and issues were discussed connected to the focused dimension from the previous week. The classes involved guided group discussion, listening, reflection, responding, imparting information, support, engendering mutual support among group members, and learning to ask for and receive support. The intervention briefly focused on self-acceptance, stress tolerance, and the ability to generate positive affect. Importantly, each session concentrated on a particular dimension inherent within maternal psychosocial adaptation, *acceptance of pregnancy, identification of the motherhood role, relationship with husband, relationship with one's maternal mother, and fears related to loss of control and self-esteem, pain, and helplessness in childbirth and lastly, concerns over safety for oneself and one's unborn child.* The *Birth of a Mother* manual aligns with each of these topics.

Table 3. Session Content

Acceptance of Pregnancy	Identification of Motherhood Role	Relationship with Husband	Relationship with Mother	Childbirth Concerns
Mood Pregnancy Discomforts Attitude to body changes Extent of ambivalence	Motherhood motives Motherhood preparation Envisioning oneself as mother Anticipating future life Attachment behavior	Mutual concern for each other's needs Pregnancy effect on marital bond	Availability of mother Reaction to pregnancy Respect for autonomy Mutual empathy	Fears: loss of control and self-esteem; Pain; Helplessness, labor/birth preparation

Control group

Gravidas randomized to the control group received the current course of treatment which included a visit from the New Parent Support Program nurse and/or information regarding available resources if they obtained a score considered “high-risk” on the Family Needs Screener. If the participant did not have a score >9 on the

risk assessment, then their prenatal supportive care consisted of support sought in the community or that obtained from friends and family. While the control group as well as the treatment group may have elected to take birthing classes, these classes did not begin for the mothers until the intervention had ended. The desired outcomes of the intervention (Tx Group) were to decrease prenatal maternal adaptive conflict, increase maternal-fetal attachment and optimistic resilience (self-esteem). Given the intervention involved aspects believed to decrease prenatal maternal conflict and increase maternal-fetal attachment as well as self-esteem, clearly the control group could receive a program that would potentially impact these particular variables. The gravidas in the control group may have received assistance (supportive care) from the NPSP nurses which could increase self-esteem and decrease prenatal conflict, it is believed however, that the program would not have as great an impact on the outcome variables as bringing the women together for the specified supportive intervention. Information was collected on the demographic data sheet pertaining to aspects of the NPSP support so that appropriate coding could be accomplished for participants receiving NPSP supportive care. Women randomized to the control group were not eliminated from NPSP offerings.

Approval from the 59th Institutional Review Board (IRB) and the Letter of Assurance from the 59th Wing Commander, was obtained prior to initiation of the study. The 59th IRB has oversight for research conducted at the 96th Medical Group, Eglin AFB Florida.

Analysis

Descriptive statistics were calculated for the sample distribution of demographic characteristics, participant attrition and attendance, and the outcome variables of prenatal adaptation to motherhood, maternal-fetal attachment, self-esteem, and perceived community support. The internal consistency for all instruments was assessed using Cronbach's alpha. The intervention and control groups were compared on baseline data to determine systematic statistically significant differences.

A univariate or mixed model approach to a repeated measures analysis of variance was used to explore the impact of the intervention on the outcome variables. The analysis emphasized testing for a group difference

and for group differences over time. Planned contrasts were used to look at group differences between adjacent times (T_1 to T_2 and T_2 to T_3). The Bonferroni adjustment was used to control the error rate at .05 for comparisons. Statistical results were considered significant if $p < 0.05$. All data calculations were performed within SAS.

Data from the Program Satisfaction Questionnaire was transcribed verbatim. Constant comparison method of qualitative analysis was used to assess the data.

Sample size estimation/power analysis

Sample size was determined based on (Elashoff, 2000) power analysis for univariate repeated measures analysis of variance. Power estimates are provided for Aim 2, Impact of the M.O.M.S. intervention on outcomes variables.

It was anticipated that the intervention would have a medium sized standardized effect on prenatal maternal adaptation and on the theoretical mediators of self-esteem and emotional support (0.6 standard deviation change from pretest to posttest) with reduction of effect to 0.4 standard deviation at the 8 week follow-up (T_3), while no change over time is anticipated in the control group. Power in a repeated measures design depends not only on the effect size but also the degree of correlation between time points. The test-retest reliability of the *Social Support Index* has been reported as .83. For the purpose of calculating statistical power, available test-retest correlations of $r = .80$ were applied. In consideration of the above assumptions, with net 22 cases in each intervention and control groups after attrition, $\alpha = .05$, and the effect sizes cited above, a .80 power to detect the proposed group by time interaction was anticipated. The proposed sample size was based on an anticipated attrition of less than 10%, given retention rates of similar longitudinal interventions (Killien & Newton, 1990; Schachman et al., 2004). Given this rate of attrition, a total sample of 55-60 participants were projected for the pilot study with an anticipated 50 participants expected to complete the study.

CHAPTER III

RESULTS

Sample Characteristics

During the recruitment period of 20 November 2007 through 15 June 2008, 521 women were contacted for potential participation in the study. Of those contacted, 448 were excluded. The primary reason for exclusion was the absence of deployment during the course of the study. Seventy-three women were recruited and consented for the study. Of this sample, 65 women (29 treatment and 36 control) completed all aspects of the study. Eight participants were lost during the course of the study due to miscarriage (6), change of duty station (1), and work requirements (1). The majority of the participants were spouses of active duty Air Force men. Seventeen of the participants were active duty married to active duty Air Force men. One participant was married to active duty Navy. The sample was well educated with 43% having some college education and 20% of the sample had completed a Bachelor's degree. Over half of the women (65%) indicated they were employed. At any point during the study, approximately 34% of the sample had deployed partners. The length of deployments ranged from less than 4 months to greater than a year. Over 40% of the sample experienced deployments of their partners for over 6 months. Many indicated not knowing the deployment location of their husbands and 18% of the sample indicating having little to no contact either through email or by phone with their partners during the period of deployment. Table 4 provides descriptive data for the sample by control and treatment groups.

Table 4. Descriptive Data for Control and Treatment Groups

	TX Group (n= 29)	Control Group (n= 36) (%)
	Mean (min-max)	Mean (min-max)
Maternal Age (yrs)	28 (21-39)	25 (19-36)
Marriage Length (months)	37 (3-168)	47 (3-180)
Maternal ethnicity		
Hispanic	3 (4.6%)	8 (12.3%)
White, non-Hispanic	21 (32.3%)	22 (33.8%)
Black, non-Hispanic	2 (3.1%)	5 (7.7%)
Asian	2 (3.1%)	1 (1.5%)
Native Indian	1 (1.5%)	0 (0.0%)
Maternal Education		
< High school graduate	1 (1.5%)	0 (0.0%)
High school diploma	5 (7.7%)	7 (10.8%)
Some college	12 (18.5%)	16 (24.6%)
Associate degree	3 (4.6%)	2 (3.1%)
Bachelors degree	5 (7.7%)	8 (12.3%)
Some graduate school	1 (1.5%)	2 (3.1%)
Graduate degree	2 (3.1%)	1 (1.5%)
Branch of Service		
Air Force	28 (43.7%)	35 (54.7%)
Navy	1 (1.5%)	0 (0.0%)
Active duty participants	7 (10.8%)	10 (15.4%)
Military rank of spouse		
Enlisted (E1-E4)	12 (18.5%)	13 (20.0%)
Enlisted (E5-E7)	11 (16.9%)	17 (26.1%)
Officer (O1-O3)	4 (6.1%)	3 (4.6%)
Officer (O4-O6)	2 (3.1%)	2 (3.1%)
Length of deployment		
1 st Trimester (n=21)		
< 4 months	4 (19.1%)	6 (28.6%)
4-6 months	3 (14.3%)	2 (9.5%)
>6 months< 1 year	0 (0.0%)	1 (4.8%)
1 year	0 (0.0%)	3 (14.3%)
>1 year	2 (9.5%)	0 (0.0%)
2 nd Trimester (n=21)		
< 4 months	5 (23.8%)	1 (4.8%)
4-6 months	3 (14.3%)	3 (14.3%)
>6 months< 1 year	1 (4.8%)	3 (14.3%)
1 year	1 (4.8%)	2 (9.5%)
>1 year	2 (9.5%)	0 (0.0%)
3rd Trimester (n=24)		
< 4 months	6 (25.0%)	4 (16.7%)
4-6 months	3 (12.5%)	2 (8.3%)
>6 months< 1 year	1 (4.2%)	4 (16.7%)
1 year	0 (0.0%)	2 (8.3%)
>1 year	2 (8.3%)	0 (0.0%)

Description of the Variables

Prenatal maternal psychosocial adaptation, maternal-fetal attachment, self-esteem, and perceived esteem-building support were measured in each trimester. Table 5 reflects the means for each scale of the PSEQ, the SSI, RSE, and MAAS. The Cronbach's alpha coefficients for each of the instruments by trimester are as follows: PSEQ, $\alpha = 0.94(1)$, $0.93(2)$, and $0.92(3)$; SSI, $\alpha = 0.85(1)$, $0.84(2)$, and $0.85(3)$; RSE, $\alpha = 0.89(1)$, $0.88(2)$, and $0.89(3)$; and MAAS, $\alpha = 0.69(1)$, $0.66(2)$, and $0.75(3)$.

Intervention Results

Study aim 1: Explore the feasibility of developing, implementing, and sustaining the M.O.M.S. program by examining gravida attendance and attrition patterns as well as acceptability, and suitability of the mentoring support intervention to gravida's of deployed service members.

The program was easy to implement and sustain. Women were provided information regarding the M.O.M.S. program during their initial obstetrical appointment. The new mother's support group nurses as well as the prenatal clinic personnel were anxious to assist with the promotion of the program. The women who elected to participate in the program were grateful for the opportunity to obtain support from other military mothers with deployed husbands. The attrition was low and participation high. The women in the study missed few if any classes. The loss of eight women due to miscarriage predominantly occurred within the treatment group versus the control, causing an unequal group size. The program continued beyond the course of the study and the data gathering. Many of the women elected to continue to attend the program long after delivery.

Table 5. Total Mean Scores for Variables by Treatment and Control Groups

TX vs. Control	N Obs	Variable	Mean	Std Dev	95% CI LL	95% CI UL
Control Group	36	ACCPREG ^a	19.51	4.69	18.6	20.42
		IDMORO ^b	19.85	3.69	19.15	20.56
		WELLBE ^c	17.56	5.65	16.48	18.63
		PREPLAB ^d	18.78	5.03	17.81	19.75
		HELPL ^e	17.83	4.44	16.99	18.68
		REHUS ^f	16.52	5.04	15.55	17.5
		RELMOTH ^g	16.18	7.47	14.73	17.62
		MAAS ^h	47.23	3.09	46.63	47.82
		SSI ⁱ	41.45	4.33	40.62	42.29
		RSE ^j	25.04	2.11	24.63	25.44
M.O.M.S. Group	29	ACCPREG ^a	20.26	5.11	19.16	21.35
		IDMORO ^b	19.9	4.71	18.88	20.91
		WELLBE ^c	17.05	5.03	15.95	18.15
		PREPLAB ^d	17.86	5.55	16.64	19.07
		HELPL ^e	17.46	4.22	16.51	18.41
		REHUS ^f	16.78	4.09	15.89	17.68
		RELMOTH ^g	16.16	6.76	14.71	17.61
		MAAS ^h	47.94	3.12	47.28	48.61
		SSI ⁱ	41.38	4.15	40.48	42.28
		RSE ^j	25.14	1.82	24.75	25.53

^aAcceptance of Pregnancy

^bIdentification with a Motherhood Role

^cConcerns for Well-Being of Self and Baby

^dPreparation for Labor

^eFear of Pain, Helplessness, and Loss of Control

^fRelationship with Husband

^gRelationship with Mother

^hMaternal Antenatal Attachment Scale

ⁱSocial Support Index

^jRosenberg Self-Esteem Inventory

Study aim 2: Evaluate the participant and interventionist's satisfaction with the "Becoming a Mother Manual" and its effectiveness at increasing group interaction.

The manual promoted discussion of the pertinent topic for that week. It focused the discussion on the dimension of adaptation congruent with where the women were in their pregnancies. The manual was developed by the media center at Eglin Air Force base. It is beautifully constructed with fantastic graphics and watermarks throughout the manual. While the manual helped the mentors focus discussion, the women participating in the study requested several additional sections. The women participating in the study requested a multi-gravida chapter as well as a chapter on postpartum adaptation. The Primary Investigator is working on these additional chapters for inclusion in a larger study.

Aim 3: Evaluate the effectiveness of the M.O.M.S. program to reduce conflict associated with prenatal maternal adaptation to pregnancy and enhance maternal-fetal attachment and self-esteem.

When assessing the main effects of the M.O.M.S. program versus the control group on all outcome variables, there were no significant differences between the treatment and control for any of the outcomes. However, when the participant's level of contact with their deployed spouse was considered for all outcome variables, significant statistical differences were found for the interaction of contact with one's deployed husband and treatment versus control group for perceived self-esteem, relationships with husbands, and perceived community support. When considering the level or amount of contact, a binary variable was created for low and high contact. The variable was created by considering the number of times the participant indicated she had spoken with her husband and also maintained contact through email each week. The values for the amount of contact by phone varied from never to more than once a day. Similarly,

the amount of contact the participant maintained with her spouse by email varied from never to three times a day. These aspects of contact were combined to form a variable of low versus high contact. Table 6 reflects the differences between the groups for high versus low contact on the variable of perceived self esteem. The women having the lowest level of contact had statistically significant lower scores for their perceived self-esteem than the women indicating greater contact with their husbands. Admittedly, the scores were not significantly different between the treatment and control groups but between the high versus low contact groups $F(2, 65) = 4.53, p < 0.02$. There were also significant differences between the groups for the anxiety associated with the participant's relationship with her husband (Table 6). Of note, the women having lower amounts of contact had significantly higher conflict associated with their relationship with their husband, while the women maintaining higher contact regardless of their group appointment, had lower anxiety associated with their relationships $F(2, 65) = 4.23, p < 0.02$. The women indicating high levels of contact with their husbands and participating in the treatment group did have the highest mean values for their overall perceived support. The difference between control and treatment groups had borderline statistical significance $F(2, 65) = 2.90, p < 0.06$.

Table 6. Marginal Means for the Two Significant Interaction Results

Contact	TX/Control	RELHUS ^a	RSE ^b
Low contact	Control group	18.90	24.08
Low contact	M.O.M.S. group	18.54	23.98
High contact	Control group	14.78	25.51
High contact	M.O.M.S. group	15.64	25.48

Note. Lower scores for RELHUS reflect lower anxiety; higher scores for RSE reflect greater self-esteem

^aRelationship with Husband

^bRosenberg Self-Esteem Inventory

CHAPTER IV

DISCUSSION

The military has supported continuous overseas contingency operations since September 2001. The ongoing deployments have placed significant stress on the military members and their families. The impact of these deployments on the family, particularly on pregnancy and prenatal maternal adaptation is not fully understood. However, pregnancy outcomes related to prenatal maternal stress and anxiety is well documented (Lederman & Weis, 2009; Lobel, 1994; Jesse, Seaver, & Wallace, 2003; Pryor et al., 2003; Ruiz, Fullerton, & Dudley, 2003). Studies indicate that pregnant women with high stress and anxiety levels are at increased risk for preterm labor and delivery of low birth weight infants (Hobel, Dunkel-Schetter, Roesch, Castro, & Arora, 1999; Misra, O'Campo, & Strobino, 2001). Lederman & Weis (2009) found that women having pregnancy-specific anxiety related to accepting one's pregnancy, identifying with one's motherhood role, preparation for labor, and fears associated with well-being of self and infant all predicted gestational age at birth. Women with the greatest anxiety associated with these particular dimensions gave birth to infants with lower gestational ages. Additionally, anxiety associated with labor and fear of helplessness and loss of control with labor predicted lower infant birth weights. Lederman et al. (2002) found that the fears women had regarding their preparation for labor correlated with anxiety related to the relationships with their husbands, suggesting that a woman concerned about her partner relationship also may be anxious about the support available to her in labor. Kalil et al. (1993) found that married women and those who had an emotional confidante or supportive partner reported lower anxiety. The marital relationship has been reported as the most significant dimension affecting the course of pregnancy (Wenner et al., 1969). The findings from this small pilot intervention reflect the

importance of the woman's contact with her husband. The women reporting the highest levels of contact with their husband throughout deployment (either by email or phone) had significantly higher reported self-esteem. Admittedly, there were no significant differences in self-esteem for those attending the M.O.M.S. session versus those not attending the support intervention. In terms of perceived support, the women having greater contact with their husbands perceived the highest levels of support. However, the women attending the M.O.M.S. group and also reporting the highest contact with their husbands had the highest mean scores for the variable of perceived support. Lastly, the women having the highest level of contact with their husbands throughout deployment had the lowest anxiety related to their marital relationship and that of the family regardless of whether they were in the control or treatment groups.

Overall satisfaction with the M.O.M.S. program was high. The participant attrition rate was eleven percent with a loss of eight women over the course of the study. However, none of the participants left the study due to dissatisfaction with the program. Instead, the greatest number of participants lost to the study were a result of miscarriage. The women also indicated high satisfaction with the *Birth of a Mother* manual as did the mentors.

Study Limitations

The lack of statistically significant results for the intervention is believed to be a result of the sample size and the strength of the intervention. The intervention timing was correct, in that it was given over the course of pregnancy, starting in the first trimester when the gravida experiences the greatest anxiety related to her prenatal maternal adaptation (Lederman & Weis, 2009). It is also during the first and second trimesters that the gravida is likely to receive the least supportive interventions. However, interventions fall short of the anticipated results when the

treatment dosage is incorrect (Sidani & Braden, 1998). The treatment was given once every-other-week during the first and second trimesters of pregnancy. During the sessions, the women were allowed to discuss their concerns relative to that particular session topic. When discussions wandered, the women were not always brought back to the designated topic. In order to have statistically significant results for the outcome variables the study sessions must include significant elements pertaining to these dimensions. Additionally, women in both groups received visits from the NPSP nurse, if they were identified as being high risk. The support provided by the NPSP nurse may have accounted for some of the equalization of the results between the groups. This information was collected, however, it was not included in the presented analysis. The women who continued to attend the treatment group after delivery may have also impacted the intervention. Lastly, data pertaining to the women's parity were not collected. In previous studies, the authors had recognized that the participants incorrectly stated this information when filling out the demographic data sheets. It was the intention to ask the participants specifically about this information. At this time, these data are not available. Admittedly, this variable may change the results of the study. Maternal psychosocial adaptation differs for each pregnancy. For the primigravida, pregnancy is a completely novel experience and the changes in the marriage may be startling (Lederman & Weis, 2009; Tomlinson, 1987). A multigravida is more likely to accept the changes, although they do not like them (Glazer, 1989; Teichman & Lahav, 1987). Lederman & Weis (2009) found no parity differences for the anxiety women experience in identifying with the motherhood role, or the relationship with their husband.

Conclusion

A woman's successful adaptation to motherhood is key to overall family health. For military wives and mothers this is the first step towards a strong family foundation that can support changing roles and responsibilities as a result of deployments and lengthy military separations. Military spouses desire support groups (Black, 1993; Faber, Willerton, Clymer, MacDermid, & Weiss, 2008). The preference is for support groups led by military spouses who have successfully coped with the military lifestyle and separation (Black, 1993). The M.O.M.S. program offers the framework for this preferred support. Obstetrical and neonatal nurses are best suited to lead the development of mentored support because of their familiarity with the pregnant woman and the family needs.

The results of this study reflect the importance of the marital relationship and the husband's supportive role in his wife's maternal adaptive process. The remote support provided through phone and email contact strengthened the woman's self-esteem. Additional research is needed to clarify the effect of positive versus negative remote interactions on the woman's prenatal maternal adaptation. Of note, this study highlighted the sustained frequency of calls and emails during deployments between husbands and wives. The impact of the frequent contact on the military member's presenteeism for work as well as the family's adaptation to the deployment is unknown.

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